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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/773,261

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11/10/2010

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EXAMINER

FREJD, RUSSELL WARREN

ART UNIT

PAPER NUMBER

2128

MAIL DATE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/773,261	Applicant(s) PARIJA ET AL.	
	Examiner Russell Frejd	Art Unit 2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,9-17 and 19-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-4,9-17 and 19-21 is/are allowed.
- 6) ☒ Claim(s) 5,6,8 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Examination of Application 10/773,261

1. Claims 1-6, 8-17, and 19-22 of application 10/773,261, filed on 9-February-2004, are pending in the application. Claims 7 and 18 are cancelled. This communication is in response to the amendment received 3-May-2010. The 35 USC 103 rejection noted in the previous office action, specifically the 103 rejection of claims 5 and 8 utilizing Chiang et al. (USP Publication 2003/0220772), is withdrawn in view of the present amendment. A new 102 rejection citing a prior art reference originally cited on the PTO Form-892 dated 28-July-2006, is submitted herewith. This action is being made non-final in view of the Notice of Allowance dated 22-December-2008, in which the present invention was found to be patentable over the 102 reference now being cited.

Specification Objections

2. The disclosure is objected to due to the term "effectiveness/efficiency metric" on page 20, line 17, and is understood to mean "effectiveness/efficiency metric".

Claim Rejections under 35 U.S.C. § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3.1 Claims 5, 6, 8, and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Michalewicz, USP Publication 2001/0051936.

3.2 Michalewicz discloses: In regard to claims 5 and 8: an apparatus for calculating a global optimization for a problem to be optimized **[section 0011: “a system that returns an optimum (or near-optimum) solution which is feasible for any nonlinear programming problem”]**, comprising:

a receiver to receive data related to said problem, for populating a model for said problem (claim 5) **[sections 0095-0097: for example: “program code can be transferred to a workstation over the Internet or some other type of network (0096)”;**

a data converter to convert said received data into data structures that thereby populate said model (claims 5 and 8) **[section 0059: “input data is organized into modules”]** *(It is noted that applicant’s specification, on page 19, line 21, states that “Calculator module 1103 includes submodules to convert the database data into the appropriate data structure formats.”);*

a first calculator to provide a plurality of minimum values (claims 5 and 8) **[section 0012: “a population of possible solutions is initialized based on input parameters defining the problem”; section 0102, lines 2-5, “the user sets some parameters of the system”; and section 0023: “a type of problem that the system and method of the present invention may solve is a design engineering problem such as the design of an engine which is modeled by an array of parameters (e.g. 100 different variables) such as pressures, lengths, component type and the like. These parameters may be labeled x_1, x_2, \dots, x_{100} . The present invention will minimize some very complex objective that is given as formula of these 100 variables, or as a procedure to exercise using these 100 variables.”]** *(It is understood by the examiner that these possible solutions are local minima that are based on parameters that are minimum values.);*

a second calculator to locate a global optimum value for said problem, given said plurality of minimum values (claims 5 and 8) **[section 0013: “the optimal solution is selected from the new population of solutions”; section 0102, lines 5-13; sections 0060 and 0061: “the best or most optimal solution is returned.” (0061)]**;

a transmission port to send said global optimum to at least one of a display device, a printer, and a memory (claims 5 and 8) **[section 0061: “the returned best solution can be presented on a screen, stored in a file, or a numerical description of the solution can serve as input to another program or computerized process,”]**.

Also, claim 8 provides a memory containing data appropriate to a problem to be optimized **[section 0096]**.

In regard to claim 6, at least one of said first calculator and said second calculator comprises a linear programming solver **{section 0094: “the computational method handles both linear and nonlinear constraints”; and section 0010: “the system should be able to handle both linear and nonlinear constraints.”}** *(The examiner posits that if the system is able to handle linear constraints as input parameters [see section 0012, last line], it is only reasonable to conclude that as these parameters are processed in the first calculator (as noted above), they are necessarily processed in accordance with a linear program solver as claimed.)*

In regard to claim 22, wherein said problem to be optimized comprises a minimum-maximum problem. To put in other words, applicant’s specification states, on page 9, lines 6-9, that “the present invention also uses an iterative procedure to solve the min-max problem, but it implements an iterative process in which local minima are first found **[Michalewicz, section 0012: “a population of possible solutions is initialized based on input parameters defining the problem...the solutions are mapped into a search space by a decoder.”** See also the discussion above in regard to claims 5 and 8, which pertains to the “first

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calculator.”], and then the maximal member among the local minima is located, thereby providing a global optimum.” [Michalewicz, section 0013: “After mapping the problem into a search space, the method then proceeds by repeatedly selecting a subset of solutions from the population of solutions, applying variation operators to the subset of solutions so that a new population of solutions is initialized, and mapping the new population of solutions into the search space. Finally, when a termination condition is satisfied (e.g. the maximum number of iterations having less than the minimum progress has been reached), the substantially optimal solution is selected from the new population of solutions.”]

Allowed Claims

4. Claims 1-4 and 9-17, and 19-21 are deemed allowable over the prior art of record at this time, pending resolution of any rejections noted above, because the prior art does not specifically claim, in regard to independent claims 1, 9 and 13: for a process, wherein is defined a linear functional form $y = f(X, c)$, where X comprises a set of independent variables $X = \{x_1, \dots, x_n\}$, c comprises a set of functional parameters $c = \{c_1, \dots, c_n\}$, and y comprises a dependent variable, where the independent variables set X is partitioned into two subsets, X_1 and X_2 , receiving data for said process [defined at p. 4, lns. 4-13]; minimizing y with respect to X_1 [p. 4, ln. 11]; and maximizing y with respect to X_2 [p. 4, ln. 11], subject to a set of constraints, wherein said maximizing y comprises a global optimum for said process [p. 4, lns. 12-13]; and sending said global optimum to at least one of a display device, a printer, and a memory [p. 17 ln. 20 through p. 18, ln. 7]. Also, in regard to independent claim 14: a linear programming solver to calculate a periphery of a polyhedron representing a region of all points that satisfy a linear constraint in a minimum-maximum problem [p. 5, lns. 15-19].

Dependent claims 2-4, 10-12, 15-17 and 19-21 are deemed allowable as depending either directly or indirectly from independent claims 1, 9, and 14.

Remarks

5. The remarks made by applicant, on pages 9-15 of the present amendment, have been considered, and the following remarks by the examiner are presented.

In regard to item 1, on page 13, alleging that paragraph [0004] of Chiang does not suggest *“receiving data for populating a model, let alone populating a min-max model”*, the examiner respectfully points out that the argument is moot due to the withdrawal of the 103 rejection citing the Chiang reference. However, it is noted that the examiner determined that the statement in section [0004] of Chiang which states, *“For most practical applications, the underlying objective functions are often nonlinear and depend on a large number of variables...”*, could have been reasonably understood as “receiving data for populating a model.”

In regard to items 2, 2A, and 2B, on pages 13-14, the only question presented by applicant (in item 2A) is directed to a contradiction in paragraph 2.2 of the previous office action, that alleges that Chiang does disclose solving the min-max problem. The examiner respectfully points out that the argument is moot due to the withdrawal of the 103 rejection citing the Chiang reference. However, the examiner does note that line 3 in section 2.2 of the previous office action should have read, “a receiver to receive data for populating a model”, and should not have included the term “min-max”.

In regard to item 3, on page 14, the examiner respectfully points out that the argument is moot due to the withdrawal of the 103 rejection citing the Chiang reference. However, the examiner notes that section 2.3 of the previous office action states that, *“It would have been*

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obvious to modify Chiang to perform the optimization of the min-max problems as disclosed in the present invention” (i.e. claims 5 and 8). The term “present invention” is in reference to applicant’s invention, and thereby includes claims 5 and 8.

In regard to item 4, on page 14, the examiner respectfully points out that the argument is moot due to the withdrawal of the 103 rejection citing the Chiang reference. However, as in the paragraph above in regard to item 3, the term “present invention” is in reference to applicant’s invention, and thereby includes claims 5 and 8.

Prior Art

6. The prior art made of record but not relied upon, discovered in an updated search, is considered pertinent to Applicant’s disclosure, and consists of :

USP 5,377,307	Hoskins et al.
USP 6,188,964	Reister et al.
USP 7,103,219	Cahill
USP 7,287,000	Boyd et al.
USP 7,383,235	Ulyanov et al.
USP 7,562,060	Sindhwani et al.
USP 7,653,522	Peralta et al.
USP Publication 2002/0196975	Cahill

Response Guidelines

7. A shortened statutory period for response to this action is set to expire **3 (three) months and 0 (zero) days** from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned (see MPEP 710.02, 710.02(b)).

7.1 Any response to the Examiner in regard to this non-final action should be

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directed to: Russell Frejd, telephone number (571) 272-3779, Monday-Friday from 0530 to 1400 ET, **or** the examiner's supervisor, Kamini Shah, telephone number (571) 272-2279. Inquires of a general nature or relating to the status of this application should be directed to the TC2100 Group Receptionist (571) 272-2100.

mailed to: Commissioner of Patents and Trademarks
P.O. Box 1450, Alexandria, VA 22313-1450

or faxed to: (571) 273-8300

Hand-delivered responses should be brought to the Customer Service Window, Randolph Building, 401 Dulany Street, Alexandria, VA, 22314.

/Russell Frejd/
Primary Examiner AU 2128